DOCUMENT RESUME

ED 209 787 EC 140 097

AUTHOR Woods, Thomas S.
TITLE The Development of Stimulus Control as a Behaviour Management Technique.
PUB DATE Apr 81
NOTE 13p.: Paper presented at the Research Forum of the Annual International Conference of The Council for Exceptional Children (59th, New York, NY, April 12-17, 1981, Session B-10).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Autism: *Behavior Modification: Early Childhood Education: *Operant Conditioning: Stimulation

ABSTRACT

The study was designed to make a 6 year old autistic child's learning sessions more productive by reducing three self stimulatory rituals. Treatment involved structured academic sessions involving the S and one other child in basic motor and vocal imitation training which was done according to Discrete Trial Format followed by structured play. In addition, consequences of brief immobilization were applied if the S emitted any of the target behaviors. Sessions began with the investigation placing a small beach hat on the S's head. S's self stimulatory behavior was almost totally eliminated in the presence of the beach hat. (SE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED209787

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

THE DEVELOPMENT OF STIMULUS CONTROL AS A BEHAVIOUR MANAGEMENT TECHNIQUE[1]

Thomas S. Woods
The Laurel House Society
1896, West 15th Avenue
Vancouver, B.C. V6J 2L1
CANADA

[1]Paper presented at the Research Forum of the 59th International Conference of the Council for Exceptional Children, New York, NY: April, 1981.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Thomas S. Woods

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EC 140097

The Development of Stimulus Control
as a Behavior Management Technique

Today, I think perhaps its a good idea to begin by telling you a little about the agency I am representing and the clients it serves. The Laurel House Society has a mandate to treat and educate young children with severe behavior disorders. In almost every case this means autism. The research I am presenting was conducted using an autistic subject; its meaningfulness to those working with the autistic will, I hope, be immediately clear; however, this research addresses a subject which is an important one in serving all persons with developmental handicaps. I believe that the findings I will be reporting can have considerable generality across degrees and types of developmental disability. Of course, that is an empirical question which will have to be tested empirically. I hope that I might be able to interest some of you sufficiently in stimulus control programming to attempt a replication or extension of these findings. It goes without saying that I would be more than willing to assist anyone in whatever way if there is any interest in attempting this type of procedure with other client populations.

Anyway, let us get on to a quick review of what has been said about stimulus control and related subjects in the literature. It is probably fair to say that over half of the field research that has been conducted (within the applied behavior analysis model) using developmentally handicapped subjects has been looking at response suppression. Unfortunately, many of our clients exhibit behaviors which are deemed undesirable by society and which stand between them and a successful and productive adjustment to less restrictive environments. When we look closely at the literature concerned with eliminating or reducing this undesirable behavior, we discover that almost all of the interest and emphasis has been focused upon the right-hand, or consequation side of the three term contingency.

Show Three-Term Contingency Transparency

Now, basic research in the experimental analysis of behavior has long recognised the importance of antecedent or ambient stimulus factors in operant conditioning. However, very little of this knowledge seems to have found application in the field. On those few occasions where reference has been made to the implications of stimulus context variables in clinical research, some important relationships seem to have been detected. Koegel, for example in 1977 found that the learning of autistic children tended to generalise better when incidental, contextual stimuli from the training environment were carried over into the transfer environment. Kazdin found in 1972 that a large measure of the impact of response cost programming had to do with the presence of environmental cues for appropriate behavior in the form of the response cost materials themselves. This has been confirmed in some of my own research in the response cost area. All this has led me to suspect that there may be an important stimulus control component in any response suppression strategy.

The familiar observation that human behavior is highly situational is related to the phenomenon of stimulus control. Skinner (1974) states that a stimulus present when a response is reinforced acquires some control over that response. Catania (1979) talks of "discriminated operants" as behaviors which have come to align with particular <u>stimuli</u> on the basis of reinforcement or punishment history. Now, if we can cause behavior to aggregate to specific stimulus conditions by reinforcing that behavior only under those conditions, we will have brought the behavior under positive, or S^d stimulus control. If, on the other hand, we can cause behavior to aggregate <u>away</u> from specific stimulus conditions by punishing or extinguishing that behavior again, only under those contitions, then we will have brought the behavior in question under negative, or S-delta stimulus control. This relationship between stimulus conditions and behavior is key in what I am presenting to you today. I began this study with the belief that if we could mark the environment with meaningful signals, perhaps we could assist our clients to recognise the prevailing behavioral expectations and then control their own behaviors accordingly. This is a very natural process. When you and I walk into an expensive restaurant and observe the Maitre D' wearing his tails, the starched linen table cloths, the low lighting, and so on, we infer from these subtle stimulus conditions certain behavioral expectations. We make adjustments to the volume

of our voices, we hopefully exclude profanity from our conversation -- in a nutshell, we read the environmental signals and govern ourselves accordingly. Low lighting, tinkling crystal, and so on, all function as an S-delta complex for behavior such as loudly demanding ketchup for one's dinner. Also, they function as an S^d complex for lowered voices, polite manners, and so on. Our behavior in MacDonalds, you would probably agree, is under much different stimulus control. Such is the nature of stimulus control in our own lives -- I am suggesting that we capitalise upon this in programming for the developmentally handicapped.

So, let's move on to the subject and his particular target behavior. This study was conducted using a six year old boy enrolled as a day student with The Laurel House Society. In addition to myriad autistic features, he demonstrated very serious learning problems which seemed to be related to high levels of observable self-stimulatory behavior. Quite a number of researchers have demonstrated that ritualistic, self-stimulatory mannerisms represent a significant obstacle to learning and otherwise handicapped children. Based upon our own anecdotal impressions and that research, we feld that we might be able to make our subject's learning sessions more productive if we eliminated or at least reduced his tendency to engage in three specific self-stimulatory rituals. These were:

i) rubbing the ears with hands or shoulders
ii) raising and staring at the ventral surface of the hand
iii) off-task non-communicative vocalisations

Because these behaviors were more episodic than discrete, baseline data was gathered in interval record form. Interval lengths of fifteen seconds within five minute sessions were chosen, and at the end of each interval, a plus or minus sign was entered on a prepared form indicating whether any of the self-stimulatory responding had occurred.

The treatment condition for this study involved three, five-minute structured academic sessions daily involving the subject and one other child in basic motor and vocal imitation training which was done according to Discrete Trial Format. These work periods were followed by five minutes of unstructured play. Sessions began with the investigator (me, that is!) placing a small beach hat (the prospective S-delta) on the subject's head and stating

"We're putting the hat on now because it's time to work." From this point forward, the sessions proceeded with me dividing my time between the two children in the group, equally. Contingent upon the subject emitting any of the target behaviors I described earlier, the following consequences were applied:

i) For ear rubbing, the hands or shoulders were briskly moved away from the ears.

ii) For "hand staring", the hand was briskly returned to its position under the subject's leg.

iii) For self-stimulatory vocalisation, the subject's mouth was covered for a period of five seconds.

It should be noted that these consequences had as their main purpose the termination of self-stimulatory responding. They were topographically specific to each of the target behaviors and resembled a contingency which has been described as "brief immobilisation" by Bitgood and his associates (1980).

Most importantly, these consequences were only applied in the presence of the S-delta, namely, the beach hat, so that a strong association between the two might develop. Correspondingly, the beach hat was never worn except when the above contingency was applied -- again to make the association between stimulus and behavioral expectations absolutely clear.

Now, in baseline, over three five minute sessions, the subject engaged in the self-stimulatory target behaviors throughout an average of 17 out of a total of 20 intervals. I will now show you the actual intervention data which depicts the steady decline of response-contingent interventions over a total of 69 sessions. Our termination criterion was five successive sessions with no self-stimulatory behavior.

Intervention Data Transparency

We might wish to ask the question, to what extent did the application of this contingency affect the beach hat, or S-delta? To answer that question we decided to run some post intervention probes without the contingency in effect. The next transparency compares baseline levels of self-stimulatory behavior to post-treatment ones, with and without the S-delta, during training sessions.

Training Probes Transparency

As you can see, prior to the treatment condition, the average number of fifteen second intervals contaminated by self-stimulatory behavior was seventeen. A comparison of the data under the S-delta present, and S-delta absent conditions in baseline reveals that, before the mild punishment contingencies were introduced, the beach hat did not exercise any noticable stimulus control over the target behavior. Hence, we may assume that initially, the beach hat was indeed a neutral stimulus. Following the intervention, the disparity between responding under the S-delta present, and S-delta absent conditions is dramatic. There is an almost total elimination of the self-stimulatory behavior in the presence of the beach hat, whereas there is only a slight drop in that behavior in the S-delta absent condition.

Unstructured Probe Transparency

This figure allows the same comparison excepting that these measures were taken outside the training sessions. Once again, rates do not differ appreciably under the S-delta present and S-delta absent conditions during baseline. It is also worthy of mentioning that the amount of baseline self-stimulatory behavior going on in unstructured time is roughly equivalent to what was going on during training before the contingencies were introduced. This shows that the target behaviors were not specific to any particular level of environmental demands. However, as the post-treatment probe shows, introduction of the S-delta into even the unstructured setting had a marked suppressive effect.

So, what do these data tell us? Well, for one thing, they support the claim that it is possible to develop discriminative properties in an initially neutral stimulus for therapeutic gain. The fact that the stimulus chosen for the experimental S-delta had in the beginning, no discriminative power, is evident when S-delta present, and S-delta absent data are compared in baseline. The two post-intervention probe phases clearly reveal an association between S-delta presence and a reduction in the rate of target responding, even though during the probes, the contingencies were temporarily suspended.

It was interesting to note that, in the structured training setting, self-stimulatory behavior was slightly reduced, post-treatment, even when the S-delta was absent. One might speculate that this was due to other, incidental factors related to the structured training environment exerting some limited suppressive control themselves. This argument is strengthened when we look at the unstructured probe comparison and find that S-delta suppression was significant but less pronounced. The difference between the two effects may derive from the absence (from the unstructured setting) of any of the supplementary S-deltas present in the structured setting. Features like the instructor's posture, the subject's posture, the training materials, etc. all may have developed some S-delta associations in Setting 1 -- such additional S-deltas are virtually non-existent in the unstructured Setting 2.

So, now we come to the point where we ask why all of this is important. Well, to begin, I think its important to recognise that all operant interventions are embedded in a context of ambient stimulus conditions. By seeking to emphasize the salience of a particular stimulus, we were able to create a convenient and portable source of stimulus control over an undesirable behavior. You could literally place the beach hat on our subject's head and eliminate a very bothersome pattern of responding in virtually any setting. With such antecedent control, we found ourselves having to apply the consequences much less often. Our subject read the signal and governed his behavior accordingly. I think this is the real value of incorporating stimulus control considerations with our suppression programmes. By building in an environmental signal, we shift some of the suppressive burden from contingency managers in the environment to the client himself. Having such self management skills broadens the horizons for the developmentally handicapped -- incorporating stimulus control provisions into our behavior change technology may be an important step in that direction. Thank you for your time and your interest.

References

Bitgood, S. C., Crowe, M. J., Suarez, Y. & Peters, R. D. Immobilisation: effects and side-effects on stereotyped behavior in children. Behavior Modification, 1980, 4, 187-208.

Catania, A. C. Learning. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1979.

Kazdin, A. E. Response cost: the removal of conditioned reinforcers for therapeutic change. Behavior Therapy, 1972, 3, 533-546.

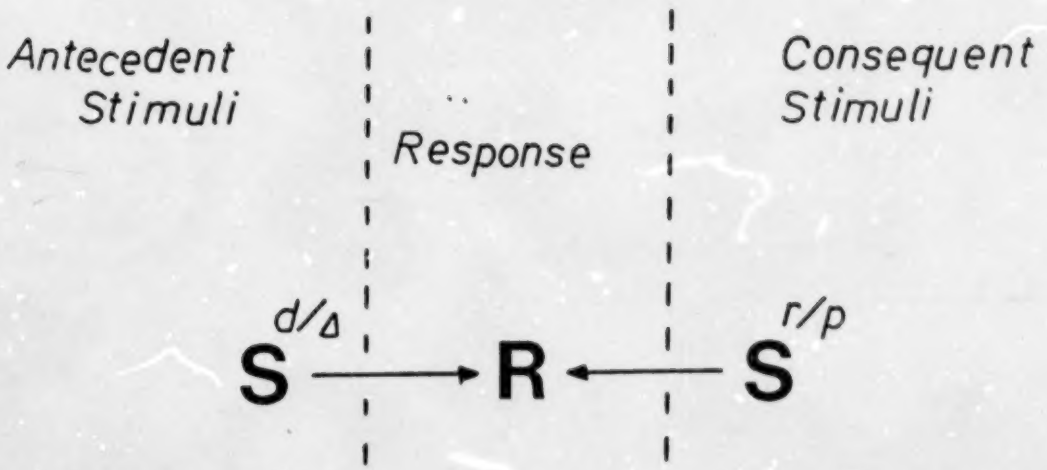
Koegel, R. L. & Covert, A. The relationship of self-stimulation to learning in autistic children. Journal of Applied Behavior Analysis, 1972, 5, 381-387.

Koegel, R. L. & Rincover, A. Research on the difference between generalisation and maintenance in extra-therapy responding. Journal of Applied Behavior Analysis, 1977, 10, 1-12.

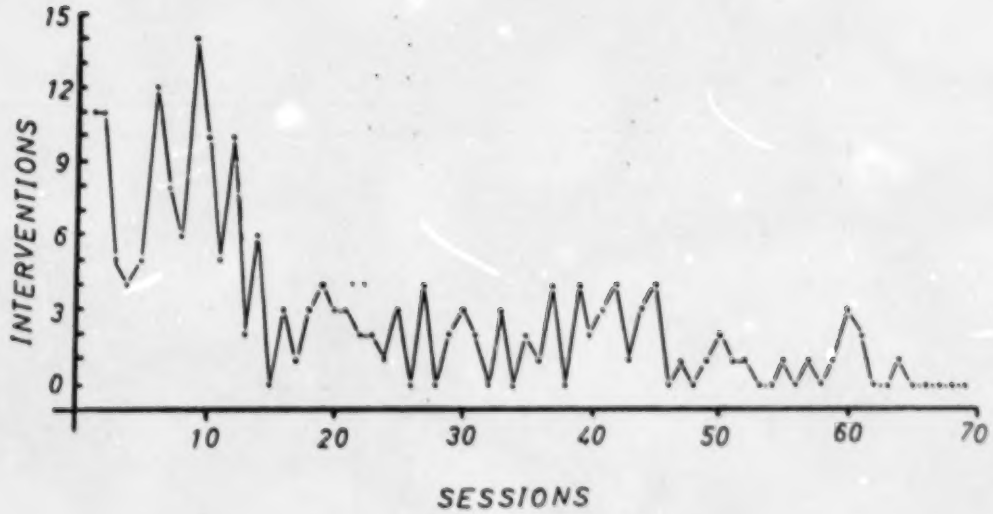
Skinner, B. F. About Behaviorism. New York: Alfred A. Knopf, Inc., 1974.

Woods, T. S. Reducing severe aggressive and self-injurious behavior in an autistic adolescent: a non-intrusive, home based approach. Manuscript submitted for publication, 1981.

THREE TERM CONTINGENCY

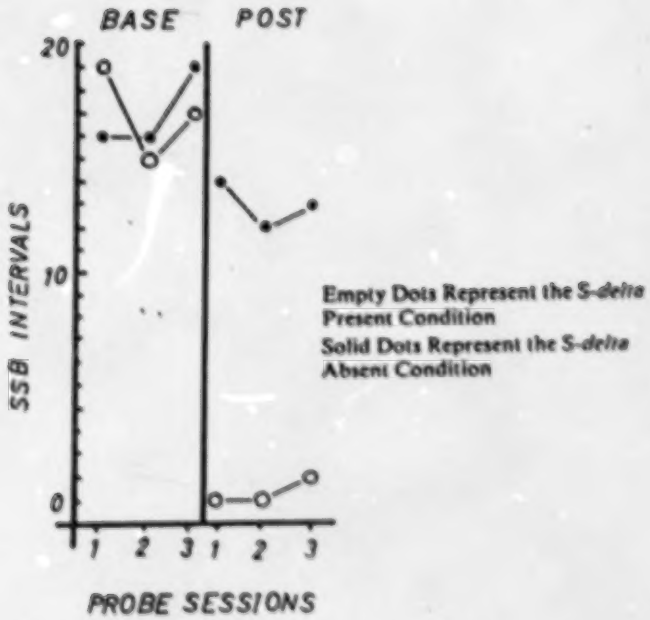


"Three Term Contingency Transparency"



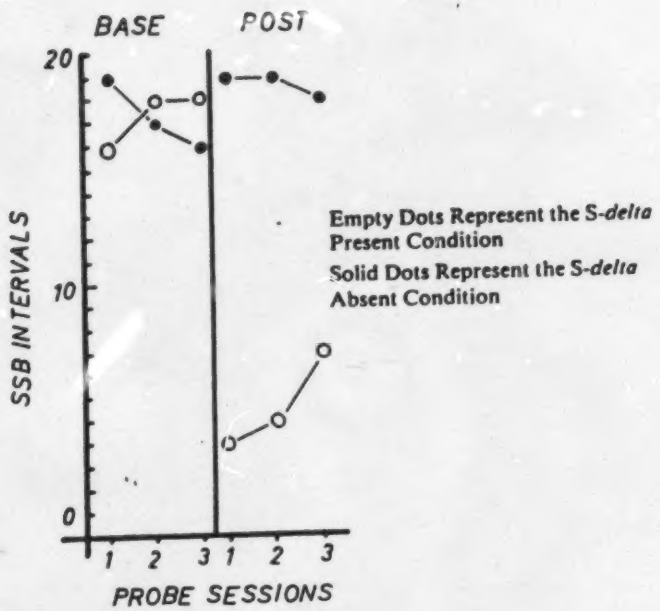
Actual Intervention Data (Response Contingent Interventions *vs* Sessions)

"Intervention Data Transparency"



Baseline and Post Intervention Interval Record Probe Sessions Conducted in the Structured, Academic Setting

"Training Probes Transparency"



Baseline and Post Intervention Interval Record Probe Sessions Conducted in the Unstructured Setting

"Unstructured Probe Transparency"